IN THE CLAIMS:

1-38. (Canceled)

39. (Previously presented) A method of inducing somatic differentiation of stem cells *in vitro* into progenitor cells said method comprising:

obtaining undifferentiated human pluripotent embryonic stem cells; and

providing a controlled differentiating condition which is non-permissive for stem cell renewal, does not kill cells or induce unidirectional differentiation toward extraembryonic lineages.

40. (Previously presented) The method according to claim 39 wherein said undifferentiated pluripotent embryonic stem cell is capable of proliferation *in vitro* and differentiation to neural progenitor cells, neuron cells or glial cells and is immunoreactive with markers for human pluripotent stem cells including SSEA-4, GCTM-2 antigen, and TRA 1-60.

41. (Previously presented) The method according to claim 39 wherein said undifferentiated pluripotent embryonic stem cell expresses Oct-4.

42. (Previously presented) The method according to claim 39 wherein said undifferentiated pluripotent embryonic stem cell maintains a diploid karyotype during prolonged cultivation *in vitro.*

43. (Previously presented) The method according to claim 39 wherein said undifferentiated pluripotent embryonic stem cell forms tumors when injected in the testis of immunodeprived SCID mice.

44. (Previously presented) The method according to claim 39 wherein said undifferentiated human pluripotent embryonic stem cell is prepared according to a method comprising:

obtaining an *in vitro* fertilised human embryo and growing the embryo to a blastocyst stage of development;

removing inner cells mass (ICM) cells from the embryo;

culturing ICM cells under conditions which do not induce extraembryonic differentiation and cell death, and promote proliferation of undifferentiated stem cells; and

recovering stem cells.

45. (Previously presented) The method according to claim 44 wherein said undifferentiated human pluripotent embryonic stem cell is prepared further comprising:

culturing the ICM cells on a fibroblast feeder layer to promote proliferation of embryonic stem cells prior to recovering the stem cells from the feeder layer, wherein the fibroblast feeder cells are arrested in their growth.

replating the stem cells from the fibroblast feeder layer onto another fibroblast feeder layer; and

culturing the stem cells for a period sufficient to promote proliferation of morphologically undifferentiated stem cells.

46. (Previously presented) The method according to claim 39 wherein the conditions for inducing somatic differentiation of stem cells are selected from any one of the following including:

culturing the undifferentiated stem cells for prolonged periods and at high density on a fibroblast feeder cell layer to induce differentiation;

culturing the undifferentiated stem cells in serum free media;

culturing the undifferentiated stem cells on a differentiation inducing fibroblast feeder layer and wherein said fibroblast feeder layer does not induce extra embryonic differentiation and cell death;

culturing to a high density in monolayer or on semi-permeable membranes so as to create structures mimicking the postimplantation phase of human development; or

culturing in the presence of a chemical differentiation factor selected from the group including bone morphogenic protein-2 or antagonists thereof.

47-50. (Canceled)

51. (Previously presented) A method of inducing differentiation of somatic progenitors to somatic cells, wherein said progenitors are derived from human pluripotent embryonic stem cells *in vitro*, said method comprising:

obtaining a source of embryonic stem cell derived somatic progenitor cells;

culturing the progenitor cells on an adhesive substrate in the presence of a serum free media and growth factors; and

inducing the progenitor cells to differentiate by withdrawal of the growth factors.

52-55. (Canceled)

56. (Previously presented) A method of inducing differentiation of somatic progenitors to somatic cells, wherein said progenitors are derived from human pluripotent embryonic stem cells *in vitro*, said method comprising:

obtaining a source of embryonic stem cell derived somatic progenitor cells, wherein the progenitor cells are neural progenitor cells capable of differentiating into neuron cells or glial cells;

culturing the progenitor cells on an adhesive substrate which comprises poly-D-lysine and laminin.

57. (Original) The method according to claim 56 wherein the cells are further cultured in the presence of retinoic acid.

58. (Previously presented) The method according to claim 56 or 57 wherein said somatic cells are neurons.

59. (Canceled)

60. (Previously presented) A method of inducing differentiation of somatic progenitors to somatic cells, wherein said progenitors are derived from human pluripotent embryonic stem cells *in vitro*, said method comprising:

obtaining a source of embryonic stem cell derived somatic progenitor cells, wherein the progenitor cells are neural progenitor cells capable of differentiating into neuron cells or glial cells;

culturing the progenitor cells on an adhesive substrate which comprises poly-D-lysine and fibronectin, wherein the progenitor cells are cultured before and after plating on poly-D-lysine and fibronectin in serum free medium in the presence of PDGF-AA and bFGF;

inducing the progenitor cells to differentiate to somatic cells under conditions which favor somatic differentiation.

61. (Previously presented) The method according to claim 60 wherein the progenitor cells are cultured after plating on said adhesive substrate in the presence of PDGF-AA, basic FGF and EGF.

62. (Previously presented) The method according to claim 61 further including culturing the somatic progenitor cells after plating on said adhesive substrate in the presence of T3.

63. (Previously presented) The method according to claim 62 wherein said somatic cells induced are glial cells.

64. (Previously presented) A method of producing an enriched preparation of human pluripotent ES cell derived neural progenitor cells, said method comprising:

obtaining undifferentiated human embryonic stem cells comprising obtaining an *in vitro* fertilised human embryo and growing the embryo to a blastocyst stage of development;

removing inner cells mass (ICM) cells from the embryo;

culturing ICM cells under conditions which do not induce extraembryonic differentiation and cell death, and promote proliferation of undifferentiated stem cells;

recovering undifferentiated stem cells;

inducing somatic differentiation of the undifferentiated embryonic stem cells to neural progenitor cells by providing differentiating conditions which are non-permissive for stem cell renewal, do not kill cells or induces unidirectional differentiation toward extraembryonic lineages;

identifying a neural progenitor cell by expressed markers of primitive neuroectoderm and neural stem cells such as polysialyated N-CAM, intermediate filament proteins such as nestin and vimentin and the transcription factor Pax-6; and

culturing the neural progenitor cells to promote proliferation and propagation.

65. (Previously presented) The method according to claim 64 wherein the the differentiating conditions comprise culturing the cells in serum free medium comprising DMEM/F12 supplemented with growth factors.

66. (Original) The method according to claim 65 wherein the growth factors include B27, EGF and bFGF.

67. (Previously presented) The method according to claim 66 including further culturing to eliminate non-neural cells, said further culturing comprising selective culturing in serum free media including DMEM/F12 supplemented with growth factors.

68. (Original) The method according to claim 67 wherein the further culturing includes the transfer of undifferentiated ES cell clumps into serum free medium comprised of DMEM/F12 supplemented with B27, bFGF and EGF and cultivation of the resulting neural progenitors as spheres or monolayers.

69-85. (Canceled)

86. (Previously presented) The method according to claim 58 wherein said neurons are mature neurons.

87. (Previously presented) The method according to claim 63 wherein said glial cells are selected from astrocyte or oligodendrocyte cells.

88. (New) A method of inducing somatic differentiation of stem cells *in vitro* into progenitor cells said method comprising:

obtaining undifferentiated human pluripotent embryonic stem cells;

culturing the undifferentiated human pluripotent embryonic stem cells on a fibroblast feeder cell layer for a prolonged period of time and at high density sufficient to induce differentiation;

further culturing the cells in serum free media thereby obtaining progenitor cells.

89. (New) A method of producing an enriched preparation of human pluripotent ES cell derived neural progenitor cells, said method comprising:

obtaining human pluripotent embryonic stem cells;

culturing the human pluripotent embryonic stem cells on a fibroblast feeder cell layer to induce differentiation;

further culturing the cells in serum free media supplemented with at least one growth factor;

identifying neural progenitor cells by the expression of at least one of expressed markers of primitive neuroectoderm and neural stem cells, intermediate filament proteins or the transcription factor Pax-6; and

culturing the neural progenitor cells to promote proliferation and propagation.

90. (New) The method of claim 89, wherein the human pluripotent embryonic are obtained by

obtaining an *in vitro* fertilised human embryo and growing the embryo to a blastocyst stage of development;

removing inner cells mass (ICM) cells from the embryo; and

culturing ICM cells under conditions which do not induce extraembryonic differentiation and cell death, and promote proliferation of undifferentiated stem cells.

91. (New) The method of claim 89, wherein said growth factor is selected from B27, EGF or bFGF.

92. (New) The method of claim 89, wherein the neural progenitor cells are identified by the expression of at least one of polysialyated N-CAM, nestin, vimentin, or Pax-6.

93. (New) The method of claim 89, wherein the neural progenitor cells are cultured in serum free media supplemented with at least one growth factor to promote proliferation and propagation.

94. (New) The method of claim 89, wherein the neural progenitor cells are cultured as monolayers or spheres.